

Harriet Hunter

## **Paediatric Pathology Elective at the Royal Manchester Children's Hospital**

I am a final year student at the University of Cambridge, and I have just completed an elective placement in the pathology department at the Royal Manchester Children's Hospital (RMCH).

I have always been fascinated by the pathology elements of our course; I have been lucky enough to have had quite substantial teaching in pathology during the first two years of my course, as well as regular clinically integrated histopathology teaching during the clinical years. As well as classical histology, this has covered more modern techniques such as immunohistochemistry and molecular testing such as FISH. Inspired by this, I decided to undertake my intercalated degree in pathology, specialising in immunology and virology. This allowed me to learn more about pathology research, particularly scientific techniques such as transgenic mouse models and cell lines. As part of this year I undertook a 16-week research project about the genetics of pre-eclampsia and placental immunology, in which I had to analyse lots of genetic samples using PCR and gel electrophoresis.

Because I knew I was interested in pursuing a career in pathology, I attended some summer schools run by both the Pathological Society and the Royal College of Pathologists, which inspired me to gain some experience in hospital based pathology. Having attended a handful of post mortems in Peterborough and Addenbrookes hospitals, which I found very interesting, I decided to use my elective to spend a longer stretch of time in a hospital pathology department, to get more of a feel for its working environment and day to day activities, as well as meeting more pathologists to ask them about their careers.

The summer schools had given me an understanding of the numerous branches of pathology, and I decided I was most drawn to paediatric and perinatal pathology. I realised that I had always been drawn to both paediatrics and obs and gynae; my pre-medical school work experience included both these specialties, and my A level biology coursework was about ways of preventing preterm labour. One of my favourite aspects of the pre-clinical course was puzzling out embryology. The self-selected aspects of my course have included my 3<sup>rd</sup> year project about pre-eclampsia, and a 6 week placement in the NICU at Addenbrooke's. As a result, I decided to look for a placement in a paediatric pathology department.

Manchester is a huge specialised centre, which allowed me to observe a lot of rare pathologies as well as the more common things. My placement was very diverse, and I gained experience in many different aspects of a working pathology department.



The Royal Manchester Children's Hospital

In the afternoons I would often go to the cut up lab, where all the specimens come in from the hospital. I was allowed to assist the pathologist in describing the gross appearance of the specimens, which ranged from appendixes to placentas, as well as smaller samples, surgical specimens, and whole tumours. Under supervision, I was allowed to cut up the specimens myself, and dictate their appearance into a clip on microphone. Cutting up the specimens required a lot of manual dexterity, especially since some of them were so small. Once the specimen had been described, we would select which pieces to look at more closely under the microscope, and put them into cassettes to be processed by the team of biomedical scientists. Particular highlights included a gall bladder full of stones, an atrophic kidney, an enormous teratoma, and a Meckel's diverticulum.

I also spent a lot of time looking at slides from specimens that had been cut up a few days previously. Despite having been taught a decent amount of pathology in medical school, at the beginning I usually couldn't get much further than identifying the organ, and maybe spotting a few inflammatory cells. I would try to look things up in one of the many massive text books around the department, but this was usually unsuccessful. However, the consultants were all amazing at teaching, and the multiheader microscopes with moveable arrows meant that slides could be explained really clearly. I really found that by the end of the placement, things were starting to make slightly more sense, and I was starting to recognise things I'd seen before. I started to get to grips with the different immunostains used for different situations, and my proudest moment was recognising a plexiform neurofibroma the second time I saw one. It was satisfying to feel that I had progressed throughout the placement – whereas the first time I saw a Hirschprung's biopsy I was totally lost, by the end I was able to spot neurons myself and interpret AChE staining.

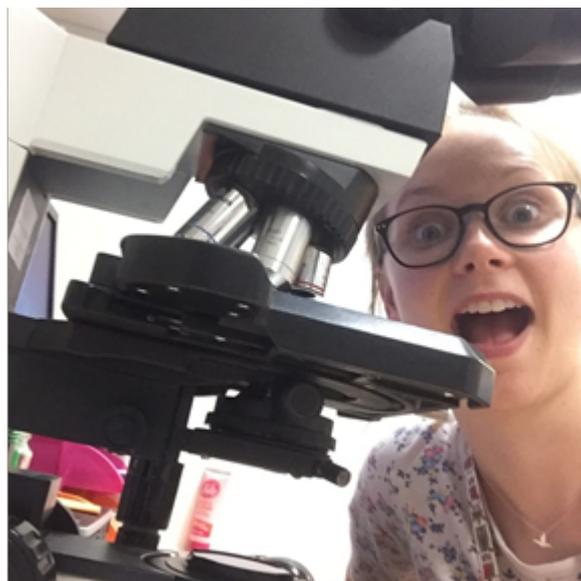
I enjoyed following cases through to the MDT meetings, having reviewed their slides with the consultant pathologist beforehand. It was so interesting to hear discussions with the rest of the team looking after the patients, and I could really see how important pathologists are to the management of patients. I was able to attend a number of different MDTs

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including renal, GI, cancer, and genetics, and it was very interesting to appreciate the pathologist's role as central to the MDT rather than somebody working solely 'behind the scenes'. It also brought home to me the huge responsibility carried by a pathologist – one wrong step from them and a patient could receive hugely inappropriate treatment.

Some of the most discussed cases we saw were Hirschprung's disease biopsies, where the pathologists have to hunt for neurons in an enormous number of sections. The pathologist's decision here is vitally important – they have to be really convinced there aren't any neurons before they give the go ahead for a surgeon to remove part of the colon. For the Hirschprung's cases especially, the team were really collaborative, and would often check with each other on the multiheader before coming to a final decision. This collaborative atmosphere was one of the things I most enjoyed about the working environment. The stereotype of the reclusive pathologist turned out to be completely unfounded (in this department at any rate), and I found it was one of the friendliest teams I have been a part of.

On one occasion I was able to follow a fresh brain biopsy on its (very speedy) journey from surgeon to microscope. It was amazing to think that the patient was still on the operating table while the biopsy was rushed to the lab, frozen in liquid nitrogen, sectioned, and then stained with H&E. In about 5 minutes, it was ready on a slide, and pathologist and surgeon looked at it together. They decided that the biopsy was sufficient, and the surgeon returned to the operating theatre.



Did I mention I got my own microscope?

Another large part of the department's workload consisted of post mortem examinations, which I was slightly apprehensive about. Although I had seen a couple before, this was going to be in a children's hospital, so I worried that they would be very upsetting to watch. Although they are obviously not 'nice' to watch, I found that the caring and respectful attitude of the pathologists and mortuary staff helped to put my fears at rest. Most of the PMs were hospital PMs for miscarriages and still births – an optional investigation for parents wishing to find out more about what might have happened. Other PMs were

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Coroner's PMs, usually for babies who had died suddenly and unexpectedly. Rather than finding it an upsetting experience, I felt it was a privilege to be able to help, and to try to provide some hope or explanation for these sad stories. As one of the trainee pathologists told me, a post mortem is the final and most thorough medical examination a person will ever have, so it is essential for it to be done respectfully and to a very high standard. This statement has added poignancy when you consider for some of these babies, it will be the only medical examination they ever have.

Once I had grown more accustomed to the idea of the post mortems, I was also able to get more involved, both practically and intellectually. Any initial shock or unpleasantness was quickly taken over by interest in what was going on. I found it so amazing to see such tiny organs, both with and without abnormalities. Some highlights were trying to puzzle out malformations in a heart the size of a 5p coin, and seeing a tiny bicornuate uterus. I was amazed by the skill of the pathologists, sometimes dissecting structures so small they required a magnifying glass.

Other experiences included going to a very dark lab to see some fluorescence in situ hybridisation (FISH) in action, and attending a coroner's inquest at the Town Hall. While on the placement I also completed 2 audits for the department.

I found this placement hugely valuable in teaching me about the life of a working pathology department. It reaffirmed my interest in a pathology career, and allowed me to appreciate the huge variety of jobs a pathologist does, leaving me with an even greater appreciation for the importance of the pathologist's work in the treatment of patients.

I would like to thank all the lovely pathologists, biomedical scientists, and mortuary staff at RMCH, Dr Liz Hook for helping me to organise the placement for me, and the Pathological Society for their generosity.